

CLAIMS

1. A fuel cell comprising:

a unit cell that includes a solid electrolyte membrane, a fuel electrode and an oxidizer electrode disposed on the solid electrolyte membrane;

a heating means that heats the unit cell; and
a fuel supplying system that supplies fuel to the fuel electrode,
wherein the heating means is provided in contact with the unit cell,

part of the fuel is supplied from the fuel supplying system to the heating means and

the heat generated when the fuel supplied to the heating means is combusted by the heating means is conducted to the unit cell so that the unit cell is heated.

2. The fuel cell according to claim 1,

wherein the heating means comprises a heating element and a heat conductor provided in contact with the heating element.

3. The fuel cell according to claim 1 or 2,

wherein the heating means includes a heating catalyst used for combusting the fuel.

4. The fuel cell according to any one of claims 1 to 3,

wherein the heating means is provided in contact with the oxidizer electrode.

5. The fuel cell according to any one of claims 1 to 4,

wherein liquid fuel is supplied directly to the fuel electrode.

6. The fuel cell according to any one of claims 1 to 5, further comprising:

a plurality of unit cells;

a plurality of first electrodes that are provided on one side of the solid electrolyte membrane; and

a plurality of second electrodes that are provided on the other side of the solid electrolyte membrane, where one second electrode is disposed opposite to one first electrode,

wherein a unit cell is composed of a pair of a first electrode and a second electrode opposed to each other, and the solid electrolyte membrane, and

the heating means heats a plurality of the unit cells.

7. The fuel cell according to claim 6, further comprising:

a temperature-measuring means that measures a heating temperature in the heating means or a temperature of the fuel cell; and

a control means that controls supply of fuel from the fuel supplying system to the heating means based on the temperature measured by the temperature-measuring means.

8. The fuel cell according to claim 6 or 7,

wherein the heating means is provided in contact with the solid electrolyte membrane.

9. The fuel cell according to claim 6 or 7,

wherein the heating means is provided in contact with a plurality of the first electrodes.

10. The fuel cell according to any one of claims 1 to 9, further comprising:

a fuel recovering means that recovers the fuel having passed through the fuel electrode into the heating means.

11. The fuel cell according to claim 6 or 7,

wherein the fuel supplying system comprises a high-concentration fuel supplying means that supplies fuel having concentration higher than that of fuel supplied to the fuel electrode to the heating means.

12. The fuel cell according to claim 11, further comprising:

a fuel mixing means that mixes high-concentration fuel supplied from the high-concentration fuel supplying means and fuel supplied to the fuel electrode.

13. The fuel cell according to claim 6 or 7, further comprising:

a heating temperature control means that controls the heating temperature of the heating means by cooling water.

14. The fuel cell according to claim 6 or 7, further comprising:

an oxidizer supplying means that supplies an oxidizer to the heating means.